

Claims

- [c1] 1. A method for extracting spring water and for recharging an aquifer from which the spring water has been extracted, comprising the steps of:
withdrawing spring water from an aquifer;
condensing water from the atmosphere; and
placing the condensed water into the aquifer from which the spring water was withdrawn.
- [c2] 2. A method according to Claim 1, wherein said condensed water is injected into groundwater in the vicinity of the site from which the spring water was withdrawn.
- [c3] 3. A method according to Claim 1, wherein said condensed water is discharged to surface water in the vicinity of the site from which the spring water was withdrawn.
- [c4] 4. A method according to Claim 1, wherein a portion of said condensed water is injected into groundwater, and a portion is discharged to surface water.
- [c5] 5. A method according to Claim 1, wherein said spring water is extracted from a well having a bore which is at least partially cased.

- [c6] 6. A method according to Claim 1, wherein water is condensed from the atmosphere by passing air through a condenser which has been chilled by passing groundwater through the condenser.
- [c7] 7. A method according to Claim 1, wherein water is condensed from the atmosphere by passing air through a condenser which has been chilled by passing spring water through the condenser.
- [c8] 8. A method according to Claim 6, wherein the groundwater passing through the condenser is drawn from an aquifer which is hydraulically separate from the aquifer from which the spring water is withdrawn.
- [c9] 9. A method according to Claim 8, wherein the groundwater passing through the condenser is injected to a portion of an aquifer which is hydraulically separate from the aquifer from which the groundwater was withdrawn.
- [c10] 10. A method according to Claim 8, wherein the groundwater passing through the condenser is drawn from beneath an impermeable stratum lying below the aquifer from which the spring water is withdrawn.
- [c11] 11. A method according to Claim 10, wherein the groundwater passing through the condenser is dis-

charged from the condenser and injected beneath the impermeable stratum from which it was drawn.

- [c12] 12. A method according to Claim 11, wherein the groundwater passing through the condenser is injected beneath the impermeable stratum at a location which is at least a six-month flow distance upgradient from the location at which the groundwater passing through the condenser is withdrawn from beneath the impermeable stratum.
- [c13] 13. A method according to Claim 1, wherein water is condensed from the atmosphere by passing air through a condenser which has been chilled by a refrigeration cycle using groundwater as a heat sink.
- [c14] 14. A method according to Claim 1, wherein said spring water is extracted from a well.
- [c15] 15. A method according to Claim 14, wherein said well is a drilled well.
- [c16] 16. A method according to Claim 1, wherein said spring water is extracted from a well having an inlet located above an impermeable stratum, with said condenser being chilled by groundwater drawn from a remote portion of the spring.

[c17] 17. A method according to Claim 1, wherein the quantity of condensed atmospheric water placed into said aquifer is approximately equal to the quantity of spring water extracted from said aquifer.

[c18] 18. A method according to Claim 1, wherein the quantity of condensed atmospheric water placed into said aquifer is greater than the quantity of spring water extracted from said aquifer.

[c19] 19. A method according to Claim 1, wherein the quantity of condensed atmospheric water placed into said aquifer is sufficient to offset adverse effects caused by spring water extraction during low flow periods.

[c20] 20. A system for providing a renewable source of potable spring water, comprising:
an extraction structure for withdrawing spring water from an aquifer;
a condenser for condensing water from the atmosphere;
and
an injection structure for placing the condensed water into the aquifer from which the spring water was withdrawn.

[c21] 21. A system according to Claim 20, wherein said extraction structure comprises a drilled well.

- [c22] 22. A system according to Claim 20, wherein heat removed from air passing through the condenser is rejected to groundwater flowing through the condenser.
- [c23] 23. A system according to Claim 20, wherein said injection structure comprises a first conductor for placing condensed water into groundwater beneath a surface of the ground, and a second conductor for placing condensed water into a surface body of water.
- [c24] 24. A system according to Claim 20, wherein said condenser comprises a refrigeration system which rejects heat to groundwater.
- [c25] 25. A system according to Claim 24, wherein said refrigeration system rejects heat to groundwater.
- [c26] 26. A system according to Claim 24, wherein said groundwater is withdrawn from a first well, and, after having passed through said refrigeration system, is rejected into a second well.
- [c27] 27. A system according to Claim 26, wherein said first and second wells are hydraulically separate from the portion of said aquifer from which the spring water is withdrawn stratum.
- [c28] 28. A method for extracting potable spring water and for

recharging an aquifer from which the spring water has been extracted, comprising the steps of:
withdrawing spring water from a first portion of an aquifer;
condensing water from the atmosphere with a condenser chilled by groundwater withdrawn from a second portion of said aquifer which is hydraulically separate from said first portion; and
placing the condensed water into said first portion of said aquifer.

[c29] 29. A method according to Claim 28, further comprising the step of returning the groundwater passing through the condenser to a location which is hydraulically separate from said aquifer.

[c30] 30. A method for recharging an aquifer, comprising the steps of:
withdrawing water from an aquifer;
condensing water from the atmosphere with a condenser chilled by passing the water withdrawn from the aquifer through the condenser; and
placing the condensed water into the aquifer.

[c31] 31. A method according to Claim 30, further comprising the step of returning the groundwater passing through the condenser to a location which is hydraulically separate from said aquifer.

rate from the point at which the water is withdrawn from the aquifer.

- [c32] 32. A method according to Claim 30, further comprising the step of returning the groundwater passing through the condenser to a location which is hydraulically connected with the point at which the water is withdrawn from the aquifer.